CLAIMS

1. An anti-reflection film comprising a transparent support, at least one hard coat layer and an outermost low refractive index layer,

wherein (a) the surface of the anti-reflection film has a central line average roughness: Ra of not greater than 0.15 μm; (b) the hard coat layer comprises at least one kind of particle and (c) the at least one kind of the particle includes a particle having an average particle diameter of not smaller than 80% of the thickness of the hard coat layer and cut point value (CP value) of coarse particles in the hard coat layer is less than 4 times the thickness of the hard coat layer.

2. The anti-reflection film as defined in Claim 1, wherein the hard coat layer further comprises at least one particle providing an internal scattering property, the at least one particle providing an internal scattering property has an average particle diameter of less than 80% of the thickness of the hard coat layer and the cut point value (CP value) of coarse particles in the at least one particle providing an internal scattering property is less than 4 times the thickness of the hard coat layer.

3. The anti-reflection film as defined in Claim 1 or 2,

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wherein the at least one hard coat layer includes a light-diffusing layer, and the light-diffusing layer has a scattered light intensity at 30° of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile measured by a goniophotometer.

4. The anti-reflection film as defined in any one of Claims 1 to 3, wherein the surface of the anti-reflection film has a central line average roughness Ra of not greater than 0.10 μm.

5. The anti-reflection film as defined in any one of Claims 1 to 4, which has a value of transmitted image sharpness of from not smaller than 40% to less than 97% as measured at a comb width of 0.5 mm.

6. A polarizing plate comprising a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the anti-reflection film described in any one of claims 1 to 5.

7. The polarizing plate as defined in Claim 6, wherein the protective film other than the anti-reflection film of the two protective films of a polarizer is an optical compensation film having an optical compensation layer comprising an

optically anisotropic layer, and

the optically anisotropic layer is a layer having a negative birefringence and comprising a compound having a discotic structure unit, the disc plane of the discotic structure unit is inclined with respect to the surface protective film plane and the angle between the disc plane of the discotic structure unit and the surface protective film plane is changed in the direction of depth of the optically anisotropic layer.

8. A liquid crystal display device comprising the anti-reflection film defined in any one of Claims 1 to 5 or the polarizing plate defined in Claim 6 or 7, as an outermost layer of the display device.

9. The liquid crystal display device as defined in Claim 8, which is one of a liquid crystal large-sized television having a size of not smaller than 21 inch and a liquid crystal wide television having an aspect ratio of 9 : 16 or greater.

10. A liquid crystal display device of a TN-, STN-, VA-, IPS- or OCB-mode transmission, reflection or semi-transmission type, comprising at least one of anti-reflection film defined in any one of Claims 1 to 5 or a polarizing plate defined in Claim 6 or 7.

11. An anti-reflection film comprising a transparent support, at least one hard coat layer and an outermost low refractive index layer,

wherein (a) the surface of the anti-reflection film has a central line average roughness: Ra of not greater than 0.15 μm, (b) the hard coat layer comprises at least one kind of particle, and (c) the at least one kind of particle includes a particle having an average particle diameter of not smaller than 80% of the thickness of the hard coat layer and the particle in the hard coat layer satisfies a relationship represented by the following formula (1):

$$0 \ \mu\text{m} \leq d_{Max} - d_{AC} \leq 7 \ \mu\text{m} \qquad (1)$$

wherein d_{Max} represents the maximum diameter of particles (unit: μm); and d_{AC} represents the average diameter of the particles (unit: μm).

12. The anti-reflection film as defined in Claim 11, wherein the hard coat layer further comprises at least one particle providing an internal scattering property, and the at least one particle providing an internal scattering property has an average particle diameter of less than 80% of the thickness of the hard coat layer and satisfies the relationship represented by the formula as defined in Claim 11.

13. The anti-reflection film as defined in Claim 11 or

12, wherein the at least one hard coat layer includes a light-diffusing layer, and the light-diffusing layer has a scattered light intensity at 30° of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile measured by a goniophotometer.

14. The anti-reflection film as defined in any one of Claim 11 to 13, wherein the surface of the anti-reflection film has a central line average roughness Ra of not greater than 0.10 μm.

15. The anti-reflection film as defined in any one of Claims 11 to 14, which has a value of transmitted image sharpness of from not smaller than 40% to less than 97% as measured at a comb width of 0.5 mm.

16. A polarizing plate comprising a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the anti-reflection film described in any one of claims 11 to 15.

17. The polarizing plate as defined in Claim 16, wherein the protective film other than the anti-reflection film of the two protective films of a polarizer is an optical compensation film having an optical compensation layer comprising an

optically anisotropic layer, and

the optically anisotropic layer is a layer having a negative birefringence and comprising a compound having a discotic structure unit, the disc plane of the discotic structure unit is inclined with respect to the surface protective film plane and the angle between the disc plane of the discotic structure unit and the surface protective film plane is changed in the direction of depth of the optically anisotropic layer.

18. A liquid crystal display device comprising the anti-reflection film defined in any one of Claims 11 to 15, or the polarizing plate defined in Claim 16 or 17, as an outermost layer of the display device.

19. The liquid crystal display device as defined in Claim 18, which is one of a liquid crystal large-sized television having a size of not smaller than 21 inch and a liquid crystal wide television having an aspect ratio of 9 : 16 or greater.

20. A liquid crystal display device of a TN-, STN-, VA-, IPS- or OCB-mode transmission, reflection or semi-transmission type, comprising at least one of anti-reflection film defined in any one of Claims 11 to 15 or a polarizing plate defined in Claim 16 or 17.